

CLAIMS

What Is Claimed Is:

1. A method comprising:
 - automatically measuring an overall power exerted by a brush motor;
 - comparing the measured brush motor power to a desired operating power; and
 - automatically adjusting the force exerted upon the brush motor to either increase or decrease the brush motor power as necessary.
2. The method of claim 1 wherein the overall power exerted by the brush motor is determined by measuring the current through the brush motor and the voltage of the power source to the brush motor.
3. The method of claim 1 wherein as the power source to the brush motor includes one or more batteries, and as the voltage level of the one or more batteries decreases, the downward force on the brush motor is increased to cause the motor to draw more current, thereby compensating for the drop in voltage and maintaining the power exerted by the motor at a particular level.
4. The method of claim 1 wherein the method is carried out by a microprocessor configured to receive a signal representative of the desired operating power and one or more signals representative of the power exerted by the brush motor and configured to generate a signal corresponding to the amount of force that should be exerted on the brush motor.
5. The method of claim 1 further comprising:
 - selecting the desired operating power; and
 - determining the difference between the measured brush motor power and desired operating power.

6. The method of claim 5 wherein the force exerted upon the brush motor is adjusted only if the difference between the measured brush motor power and desired operating power is greater than the threshold power error.
7. The method of claim 1 wherein an actuator is operated to exert a downward force upon the brush motor.
8. The method of claim 7 wherein the downward force on the brush motor is increased to increase the actual power and the downward force on the brush motor is decreased to decrease the actual power.
9. The method of claim 1 further comprising:
 - determining a brush power by multiplying the overall power exerted by the brush motor by a brush motor efficiency factor;
 - comparing the brush power to the desired operating power; and
 - automatically adjusting the force exerted upon the brush to either increase or decrease the brush power to reduce the difference between the brush power and the desired operating power.
10. A floor maintenance tool comprising:
 - a tool motor;
 - a power source to power the tool motor;
 - a power selection switch for selecting a desired operating power for the tool motor;
 - an actuator configured to exert a desired amount of force upon the tool motor; and
 - a feedback control system configured to
 - measure the overall power exerted by the tool motor,
 - digitally compare the measured motor power to a selected desired operating power, and
 - automatically adjust the force exerted upon the tool motor to either increase or decrease the tool motor power to reach the desired operating power.

11. The floor maintenance tool of claim 10 further comprising:
determining the difference between the measured motor power and the selected desired operating power.
12. The floor maintenance tool of claim 11 wherein the force exerted upon the tool motor is adjusted only if the difference between the measured motor power and selected desired operating power is greater than the threshold power error.
13. The floor maintenance tool of claim 10 wherein the power exerted by the tool motor is measured by measuring the current through the tool motor and the voltage of the power source to the tool motor.
14. The floor maintenance tool of claim 10 wherein as the power source to the tool motor includes one or more batteries, and as the voltage level of the one or more batteries decreases, the downward force on the tool motor is increased to cause the motor to draw more current, thereby compensating for the drop in voltage and maintaining the power exerted by the motor at the selected desired power level.
15. The floor maintenance tool of claim 10 wherein a microprocessor receives a signal representative of the desired operating power and one or more signals representative of the power exerted by the tool motor and generates a signal corresponding to the amount of force that should be exerted on the tool motor.
16. The floor maintenance tool of claim 10 further comprising:
a tool frame, the tool motor coupled to the tool frame;
a propulsion motor coupled to the tool frame; and
a plurality of wheels coupled to the propulsion motor, the propulsion motor to rotate the plurality of wheels.

17. The floor maintenance tool of claim 10 further comprising:

a brush coupled to the tool motor, wherein the feedback control system configured to determine a brush power by multiplying the tool motor power by a tool motor efficiency factor,

compare the brush power to the desired operating power, and automatically adjust the force exerted upon the brush to either increase or decrease the brush power to reach the desired operating power.

18. A power control system comprising:

a rotary brush;

an electric motor coupled to the rotary brush to rotate the rotary brush;

an actuator coupled to the electric motor, the actuator to exert an upward or downward force on the rotary brush;

a power source coupled to the electric motor and drive the electric motor;

a current sensor electrically coupled to the electric motor to measure the current passing through the electric motor;

a voltage sensor coupled to the power source to measure the voltage level of the power source;

a power selector to select a desired operating power; and

a processor coupled to the actuator, the controller configured to receive a first signal, corresponding to the measured current from the current sensor, and a second signal, corresponding to the measured voltage level from the voltage sensor,

determine an actual power exerted by the electric motor,

compare the actual power exerted by the electric motor to the desired operating power, and

adjust the pressure exerted by the actuator on the rotary brush to match the actual power exerted by the electric motor to the desired operating power.

19. A machine-readable medium having one or more instructions for controlling the power exerted by a rotary floor-maintenance tool, which when executed by a processor causes the processor to:

- receive a first value, corresponding to the measured current from the rotary floor-maintenance tool;
- receive a second value, corresponding to the measured voltage level of a power source for the rotary floor-maintenance tool;
- calculate an overall power for the rotary floor-maintenance tool using both the first value and second value; and
- compare the overall power exerted by the rotary floor-maintenance tool to a selected operating power to determine a power error value.

20. The machine-readable medium of claim 19 further comprising:
compare the power error value to a permitted error value.

21. The machine-readable medium of claim 20 further comprising:
adjust the pressure exerted on the floor-maintenance tool if the power error value is greater than the permitted error value.

22. The machine-readable medium of claim 21 further comprising:
increase the force exerted on the floor-maintenance tool if the overall power is less than the selected operating power; and
decrease the force exerted on the floor-maintenance tool if the overall power is greater than the selected operating power.